determining the optimum linear combination of the values of the azimuthal angles ϵ (**105**, **203**) and of the inclination angles γ (**104**).

**5**. The method according to claim **1**, wherein the predetermined, expected acceleration in the Z direction is equal to zero or equal to the acceleration of gravity.

**6**. The method according to claim **1**, wherein at a point of rest of the writing rod tip of the electronic pen with respect to the writing substrate plane—said point of rest resulting from the setting of a full stop/dot—the drift in the X and Y directions is locally read from the integrated velocity signal, and the pen position signal to be output is corrected in this way.

**7**. The method according to claim **1**, wherein errors in the ascertained inclination of the handwriting are corrected and compensated for by comparing the ascertained inclination of the handwriting with a postulated inclination of the handwriting.

**8**. The method according to claim **1**, wherein an absolute referencing of the position, of the location signal, of the electronic pen (**100**, **200**, **300**) on the writing substrate (**108**, **205**) is carried out through a determination of the inclination angle γ (**104**) together with the measurement of the strength of or of the change of the natural magnetic field or of a local artificial magnetic field.

**9**. An electronic pen (**100**, **200**, **300**) with pen position recognition, the pen comprising a writing rod, at least one electric voltage source, at least one digital control unit, at least one data transmission module as well as inertial measurement sensors,

characterized in that

the digital control unit is configured for specifying a writing coordinate system with two orthogonal axes X, Y (**101**, **102**, **201**, **202**) on the writing substrate (**108**, **205**) and an axis Z (**103**) perpendicular to the two-dimensional writing substrate (**108**, **205**), wherein the X axis (**101**, **201**) defines a predominant writing direction and the writing substrate coordinates x, y are defined with respect to said writing coordinate system, and is additionally configured for

compensating an undesirable drift in a pen position signal of the electronic pen (**100**, **200**, **300**) to be output, comprising a configuration of the digital control unit for:

executing in parallel a coordinate transformation of the azimuthal angle ϵ (**105**, **203**) and of the inclination angle γ (**104**) of the electronic pen (**100**, **200**, **300**) into writing substrate coordinates x, y for the values of the azimuthal angle ϵ (**105**, **203**) and of the inclination angle γ (**104**) determined from the inertial measurement sensors as well as for a plurality of additional predeterminable values of the azimuthal angle ϵ (**105**, **203**) and the inclination angle γ (**104**), the coordinate transformation comprising

determining the optimum linear combination of the values of the azimuthal angle ϵ (**105**, **203**) and of the inclination angle γ (**104**) at which a minimum deviation of an ascertained acceleration of the electronic pen in the Z direction from a predetermined, expected acceleration in the Z direction is accomplished, and

selecting the determined values of the azimuthal angle ϵ (**105**, **203**) and of the inclination angle γ (**104**), which result in a minimum deviation of an ascertained acceleration of the electronic pen in the Z direction from a predetermined, expected acceleration in the Z direction, for correcting a pen position signal to be output.

**10**. A system for electronically recognizing pen positions, comprising an electronic pen (**100**, **200**, **300**) according to claim **9** and configured for executing a method of recognizing and evaluating pen positions of an electronic pen (**100**, **200**, **300**) with inertial measurement sensors during writing on a two-dimensional writing substrate (**108**, **205**), the method comprising

initially specifying a writing coordinate system with two axes X, Y (**101**, **102**, **201**, **202**), which are orthogonal to each other on the writing substrate (**108**, **205**) and an axis Z (**103**) perpendicular to the two-dimensional writing substrate (**108**, **205**), the X axis (**101**, **201**) defining a predominant writing direction, and writing substrate coordinates x, y being defined with respect to said writing coordinate system,

compensating an undesirable drift in a pen position signal of the electronic pen to be output, the compensating comprising:

executing in parallel a coordinate transformation of the azimuthal angle ϵ (**105**, **203**) and of the inclination angle γ (**104**) of the electronic pen (**100**, **200**, **300**) into writing substrate coordinates x, y for the values of the azimuthal angle ϵ (**105**, **203**) and of the inclination angle γ (**104**) determined from the inertial measurement sensors as well as for a plurality of additional predeterminable values of the azimuthal angle ϵ (**105**, **203**) and the inclination angle γ (**104**), the coordinate transformation comprising

determining the optimum linear combination of the values of the azimuthal angle ϵ (**105**, **203**) and of the inclination angle γ (**104**) at which a minimum deviation of an ascertained acceleration of the electronic pen in the Z direction from a predetermined, expected acceleration in the Z direction is accomplished, and

selecting the determined values of the azimuthal angle ϵ (**105**, **203**) and of the inclination angle γ (**104**), which result in a minimum deviation of an ascertained acceleration of the electronic pen in the Z direction from a predetermined, expected acceleration in the Z direction, for correcting a pen position signal to be output;

at least one data reception module for receiving data transmitted by the data transmission module of the electronic pen (**100**, **200**, **300**),

a data evaluation unit for evaluating and processing the received data, a data output unit and a data storage unit,

the data evaluation unit capable of integrating the received data and of correcting errors therein and of outputting the processed data on the data output unit or of storing them on the data storage unit.

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